"NON-THREADED APPARATUS FOR SELECTIVELY ADJUSTING THE ELEVATION OF A BUILDING SURFACE"

This application is a Continuation-In-Part of pending Continuation-In-Part U.S. Patent Application Serial No. 10/109,786, filed March 29, 2002 which is a Continuation-In-Part of now issued U.S. Patent No. 6,363,685, entitled "Method and Apparatus for Selectively Adjusting the Elevation of an Undulating or Planar Surface" each issued patent or patent application being incorporated herein by reference in their entirety.

FIELD OF THE INVENTION

The present invention relates to a non-threaded, portable device which can be used to selectively adjust the height, level and orientation of a building surface such as a walk, floor, deck or porch during the construction therein.

BACKGROUND OF THE INVENTION

During the construction of patios, decks, floors and other building surfaces, it is imperative that a level surface or a surface with a gradual, consistent grade be maintained. This is most often accomplished over ground surfaces which are uneven, non-level and difficult to work with. Previous attempts have been made by builders to effectively eliminate this problem, including leveling the uneven surface by hand or with machinery, using wedge shims, spacers and selectively cutting numerous vertical support work pieces until the proper length and resultant grade is obtained. Unfortunately, all of the aforementioned methods are time consuming, generally ineffective and expensive.

One possible solution to the aforementioned problem was disclosed in U.S. Pat. No. 5,588,264 to Buzon (hereinafter the '264 patent). In the '264 patent, a leveling device was disclosed which included a tubular stem which was threadingly coupled with a crown member and a foot member. To adjust the elevation of a work surface such as a patio deck, the tubular stem was screwed into a base member to increase the height of the leveling device, or subsequently rotated and screwed in an opposite direction to decrease the height of the leveling device. This device allowed portions of the work surface to be raised or lowered quickly and effectively without having to add shims, move dirt or cut additional lumber or other materials. The devices disclosed and covered in the '264 patent have a specific limited range of height since differing units can be raised within a range of approximately 0.75 - 3.0 inches. Thus, the device is very limited in use and one unit cannot be used in a majority of situations where a custom fit piece is required to level a building surface. Further, the threading incorporated into the Buzon apparatus is time consuming to use, and not applicable in applications where it is difficult to provide rotation.

Another problem found in the art is the inability to utilize a standard vertical adjustment aperture with a plurality of removable "heads" which are adapted for a multiplicity of uses. For example, one type of head may be designed to align and support a structural member such as a beam or stud, while a different type of head may include one or more projections designed to support a grating material. Other adjustable heads may be designed to support pipe or any other type of material where elevation and alignment are critical.

Additionally, there is a significant need in numerous industries for a device which can be used to selectively adjust and secure the length of a device without turning the mechanism. This is especially true in applications where it is impractical to turn a tool, or extremely time consuming.

Thus, there is a strong need in the construction trades and industry in general for a leveling device which is simplistic to use, stable, can be modified on site with common hand tools, and which can be expandable with a variety of accessory components to provide a wide range of selectively adjustable lengths. Further, there is a strong need for a non-threaded ratcheting type adjustment apparatus which can be used to selectively adjust and secure the length of tripods, poles, scaffolding trench support mechanisms and other apparatus in a quick, efficient method.

SUMMARY OF THE INVENTION

It is thus one aspect of the present invention to provide an adjustable, non-threaded leveling apparatus which can be modified quickly and easily without tools to accommodate a variety of different lengths to support a deck, porch floors or mechanical equipment (such as pumps) or other similar building surfaces. The leveling device can be used independently, or more commonly with a plurality of other adjustable support devices to create a level surface or a surface with a slight grade for drainage purposes.

In another aspect of the present invention, a base member is provided which supports the tubular stem and crown member, and which has a greatly increased and widened base surface to provide stability. Further, the base member may have a plurality of drainage weep

holes to allow water to drain through the substrate to avoid freezing and potential breakage. Further, a plurality of attachment apertures may be provided to receive nails, screws and other attachment hardware to allow the base member to be interconnected to a building surface.

It is another aspect of the present invention to provide a non-threaded ratcheting mechanism which can be used in substantially any type of tool or other device which requires that a length be quickly adjusted, and secured. For example, telescoping tripods, extension poles, trenching equipment, scaffolding support members, etc. may utilize such a device that is inherently stronger than pins inserted through apertures in telescoping poles, and less time consuming than threaded adjustment members.

It is yet another aspect of the present invention to provide a crown member which is screwed onto the tubular stem member and which can be raised or lowered to selectively adjust the total height of the leveling apparatus. The top of the crown member preferably includes a plurality of alignment tabs which are used to align the construction materials such as a wood deck panel, a patio paver, cement block or framing joist. Alternatively, one or more of the alignment tabs can be quickly removed to provide a flat support surface.

It is a further aspect of the present invention to provide a removable crown coupling member which matingly engages the upper planar surface of the crown member to provide slightly more length to the adjustable support piece. Further, a non-skid pad may be provided which fits on either the upper planar surface of the crown coupling member. The non-skid pad is preferably made of a rubber, and has a sufficient coefficient of friction to prevent the

deck panels or stone pavers or other common materials from shifting on the adjustable support piece after installation.

It is a further aspect of the present invention to provide a locking mechanism in the present device which can either permanently or temporarily secure two telescoping members in a preferred length or height to prevent accidental disengagement. Thus, in one embodiment of the present invention a screw, bolt, nail, adhesive, clamp or other type of device may be used for securement.

Thus, in one aspect of the present invention, a non-threaded apparatus is provided for selectively adjusting the elevation of a building surface, comprising:

an open-ended, substantially cylindrical base having an upper end, a lower end, an exterior surface, and an interior surface;

a footing member interconnected to a lower end of said cylindrical base, said footing member having a greater diameter than said cylindrical base to provide enhanced stability;

a first plurality of circumferentially oriented ribs integrally interconnected to said interior surface of said substantially cylindrical base and positioned between said upper end and said lower end, wherein an internal diameter of said cylindrical base is selectively reduced in predetermined locations;

a substantially cylindrical shaped support member having an upper end, a lower end, an exterior surface and an interior surface;

a second plurality of circumferentially oriented ribs integrally interconnected to said outer surface of said cylindrically shaped support member, wherein said upper end of said open ended substantially cylindrical base is adapted to receive said lower end of said support

member when said first and said second plurality of circumferentially oriented ribs are offset, and wherein when said support member is rotated with respect to said substantially cylindrical base, said first and second plurality of ribs operably engage to substantially prevent vertical movement; and

a head portion interconnected to said upper end of said cylindrical shaped support member, said head portion having a geometric profile adapted for engagement with the building material to provide operable support.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded front perspective view of the present invention;

Fig. 2 is a front elevation view of the invention shown in Fig. 1, but depicted as assembled;

Fig. 3 is a cutaway view of the invention depicted in Fig. 2, taken along lines 3-3;

Fig. 4 is a cutaway view of the invention depicted in Fig. 1, taken at line 4-4;

Fig. 5 is a cut-away view of the invention depicted in Fig. 1, taken along lines 5-5; and

Fig. 6 is a front elevation view of an alternative embodiment of the present invention shown in use, and supporting a building material.

DETAILED DESCRIPTION

Referring now to the drawings, Figs. 1 - 5 represent various depictions of one embodiment of the present invention. Fig. 6 is an illustration of an alternative embodiment of the present invention, and shown in use. More specifically, Fig. 1 represents a front exploded view of the portable apparatus 2 provided herein. As shown, the portable apparatus 2 is generally comprised of a footing member 4 which is interconnected to a base member 6, the base member comprising a base member upper end 8 and a base member lower end 10. In one embodiment, the footing member 4 may be integrally interconnected to the base member 6. The base member 6 further comprises an interior surface 12, an exterior surface 14, and is adapted to receive a support member 16. As seen in Fig. 1, both the base member 6 and the support member 16 have a substantially cylindrical geometry, and are sized to matingly fit together, wherein the support member lower end 20 is received by the base member upper end 8.

Referring more specifically now to the support member 16, a plurality of circumferentially oriented ribs 28 are provided on an exterior surface 24, and which have a greater external diameter than the other portion of the support member 16. Likewise, the base member interior surface 12 has a plurality of circumferentially oriented ribs 28 which project outwardly, and thus reduce the base member internal diameter. The support member upper end 18, further comprises a plurality of threads 26 in one embodiment, which are designed to be threaded on to a head portion 40. The head portion 40 has an upper surface 36, which may be either planar for certain applications, or have one or more alignment tabs

30 or other geometric configurations designed to support or retain a building surface 44 or other apparatus.

Referring now to Fig. 2, the invention of Fig. 1 is shown assembled. More specifically, the support member 16 is shown positioned within the base member 6, while the head portion 30 is screwed to the support member upper end 18. Furthermore, a locking member 42 is identified, and which may be used to secure the support member 16 to the base member 6 to prevent rotation and the subsequent disengagement of the support member 16 to the base member 6. More specifically, the locking member may be used in a temporary manner or permanently and may be comprised of a screw, a bolt, a nail, an adhesive, a clamp mechanism, or any other type of device which would prevent rotation of the support member 16 with respect to the base member 6. As further shown in Fig. 2, the footing member 4 may include support fins 34 to provide additional structural support. In combination, the footing member 4 and support fins 34 provide a wider base for stability, and in a preferred embodiment is integrally interconnected to the base member lower end 10.

In use, the apparatus shown in Fig. 2 is positioned below a building surface such as paver, pipe, or other construction material or industrial apparatus which requires an elevation adjustment. The support member 16 is moved vertically with respect to the base member 6 until a desired elevation is achieved. This is possible by aligning the circumferentially oriented ribs 28 of the support member 16 with the circumferentially oriented ribs 28 positioned within the base member interior surface 12, wherein the support member 16 is free to travel in a vertical direction within the base member 6. Once the preferred elevation of the portable support apparatus 2 is achieved, the support member 16 is rotated with respect

to the base member 6, and the opposing circumferentially oriented ribs 28 of the base member 6 and the support member 16 become engaged and prevent vertical movement. If additional adjustment is necessary, the support member 16 is simply rotated with respect to the base member 6 and the circumferentially oriented ribs 28 are disengaged, thus allowing vertical movement until a preferred height is achieved. Once the majority of the vertical adjustment is obtained, fine adjustments in vertical height may be made by rotating the head member 40 with respect to the support member upper end 18. As shown in Fig. 1, preferably the support member upper end 18 has a threaded exterior surface, which matingly engages with the head member lower surface which has opposing threads. However, as appreciated by one skilled in the art, the portable support apparatus 2 may be constricted with or without the support member 16 being threaded to the head portion 40, and in one embodiment the head portion 40 may be integrally interconnected to the support member upper end 18.

Referring now to Fig. 3, a cross sectional front elevation view of the embodiment shown in Fig. 2 is provided herein. More specifically, the engagement of the circumferentially oriented ribs 28 of the base member 6 and the support member 16 is shown, and the threaded portion of the support member upper end 18 as it is engaged to the head 40. Additionally, the alignment tabs 30 are shown, and the general configuration of the various components require for the portable support apparatus 2.

Referring now to Fig. 4, the portable support apparatus 2 depicted in Fig. 1, is shown taken at line 4-4. More specifically, the opposing alignment of the circumferentially oriented ribs 28 are shown, and in this embodiment they are oriented at approximately 180 °. As

appreciated by one skilled in the art, it is not necessary to have two pairs of circumferentially oriented ribs on the support member 16, and in conjunction with two circumferentially oriented ribs 28 on the base member 6. More specifically, one set of circumferentially oriented ribs 28 could be utilized, and which may be rotated to engage with the opposing set of circumferentially oriented ribs 28 on the base member 6. However, in the embodiment shown in Figs. 1-5, two sets of circumferentially oriented ribs 28 are provided on both the support member 16 and the base member 6, and which are oriented in an opposing relation at approximately 180° apart. Alternatively, three or more circumferentially oriented ribs 28 could be utilized on the support member 16 and base member depending on the specific application.

Referring now to Fig. 5, a cross-sectional plan view of the base member 6 is provided herein, and taken along line 5-5 of Fig. 1 and which clearly shows the opposing position of the circumferentially oriented ribs 28 and the base member interior surface 12. As depicted in Fig. 5, the circumferentially oriented ribs 28 reduce the internal diameter of the base member 6, and that the circumferentially oriented ribs 28 may be aligned in a way to receive the circumferentially oriented ribs 28 of the support member 16.

Referring now to Fig. 6, an alternative embodiment of the present invention is provided herein wherein the portable support apparatus 2 has a base member 6 with a slightly different geometric configuration of the base member 6 shown in Fig. 1. More specifically, the support fins 34 extend higher in a vertical direction for additional support, and the footing member 4 may have a slightly greater diameter for stability. Fig. 6 further illustrates the positioning of a building surface or other apparatus 44 with respect to the head member 40.

In this particular diagram, a plurality of paver materials are shown on one type of an alignment tab 30. As appreciated by one skilled in the art, any numerous type of head members 40 may be utilized which have a variety of different geometric configurations specifically designed for an intended use, such as supporting a pipe, piece of machinery, etc.

As appreciated by one skilled in the art, the non-threaded support apparatus 2 of the present invention may be used in applications not specifically adapted for building applications. More specifically, instead of being used to support a building material, the ratcheting mechanism of the present invention may be used in any kind of tool or other device which has telescoping members which require an adjustment in length. For example, a tripod used for a camera or spotting scope may utilize this type of ratcheting mechanism as opposed to a compression fit, or telescoping members with a threaded device or a pin and aperture to secure positioning. Other uses may include extendable poles, scaffolding materials, support pieces which have horizontal adjustments used to protect workers in trenching or other applications, and substantially a limitless number of other applications where a telescoping member or other horizontal or vertical adjustment is required in a quick, efficient, and safe manner. Additionally, once the apparatus is positioned to a desired length, it is preferred that a locking mechanism may be used for either temporary or permanently securing the apparatus ion a fixed position. As previously discussed, these types of locking mechanisms are commonly known in the art, and may include a pin and aperture, a nail, a screw, a clamping mechanism, a compression fit, or other similar devices.

For clarity purposes, a detailed list of the various components of the present invention and the associated numbering is provided herein.

Number	Component
2	Portable support apparatus
4	Footing member
6	Base member
8	Base member upper end
10	Base member lower end
12	Base member interior surface
14	Base member exterior surface
16	Support member
18	Support member upper end
20	Support member lower end
22	Support member interior surface
24	Support member exterior surface
26	Threads
28	Circumferentially oriented ribs
30	Alignment tabs
32	Footing apertures
34	Support fins
36	Head member upper planar surface
38	Footing member upper planar surface

40	Head portion
42	Locking member
44	Building material

While various embodiments of the present invention have been described in detail, it is apparent that modification and adaptations of those embodiments will occur to those skilled in the art. However, it is to be expressly understood that such modifications and adaptations are within the scope of the present invention as set forth in the following claims.